

Abstract of the Disclosure

The subject invention pertains to a method of spark processing silicon and resulting materials. The subject invention also relates to electroluminescent devices incorporating the materials produced by the subject method. The subject method for spark-processing can enhance the EL output, as compared with conventional spark-processed (sp) silicon. The enhancement of EL output can be due, at least in part, to increasing the light emitting area. The subject method can smooth the sp surface, so as to allow more complete coverage of the sp area with a continuous, semitransparent, conducting film. The smoothening of the sp surface can be accomplished by, for example, introducing into the spark plasma a volatile liquid, such as methanol, ethanol, acetone, in which particles can be suspended and/or in which a heavy ion salt is dissolved. The particles preferably float in the volatile liquid, rather than settle quickly. In a specific embodiment, silicon particles in the range of about 0.2 μm to about 20 μm in size can be suspended in the volatile liquid, such as methanol. The volatile liquid/silicon-particle suspension or volatile liquid/heavy ion salt solution, can then be inserted into a means for applying the mixture to the surface of a silicon wafer during spark-processing.